

III. *Some Account of Aucklandia, a new Genus of Compositæ, believed to produce the Costus of Dioscorides.* By HUGH FALCONER, M.D., Superintendent of the Hon. East India Company's Botanic Garden at Saharunpore. Communicated by J. F. ROYLE, M.D., F.R.S. & L.S.

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ORD. NAT. *Compositæ*, Tr. *Cynurææ*, Subtr. *Carlineæ*, DeCand., Prodr. 5. p. 351.

AUCKLANDIA. *Falc.*

CHAR. DIFF. *Capitulum* homogamum. *Antherarum* caudæ lanato-plumosæ. *Pappi paleæ* æqualiter biseriales, plumosæ, basi ternatim quaternatimve cohærentes, in annulum deciduum concretæ. *Achenium* glabrum.

CHAR. GEN. *Capitulum* homogamum, multiflorum. *Involucrum* ovato-globosum, imbricatum, multiseriale: squamis oblongis, adpressis, cum acumine calloso patulo in setam desinente. *Receptaculum* convexum alvcolato-fimbrilligerum. *Corollulæ* æquales 5-fidæ, tubo elongato gracili basi subdilatato, fauce longiusculè ampliata, lobis linearibus æqualibus. *Antheræ* apice breviter appendiculatæ, basi in caudas lanato-plumosas productæ; *filamenta* glabra. *Styli rami* elongati, liberi, divergentes. *Achenium* glabrum, obovatum, crassum. *Pappi paleæ* æquales, biseriales; setis plumosis, basi ternatim quaternatimve cohærentibus, in annulum deciduum concretis.

Herba *orgyalis*, *perennis*, *alpicola*, in *montibus Cashmeeriensibus copiosissimè obvia*; radice *crassâ, subfusiformi-ramosâ, valde aromaticâ*; caule *simplici erecto stricto folioso*; foliis *alternis, amplissimis, sublyratim pinnatifidis, lobo terminali maximo hastato-cordato erosè dentato, dentibus setâ terminatis*; capitulis *terminalibus, sessilibus, 5-8 aggregatis*; floribus *atro-purpureis*.—*Radix Costus dicta in medicinâ veterum et Arabicâ celeberrima, et Asiaticis hodiernis in usu frequentissimo, diu sed falsò a Linnæo et aliis a Costo Arabico inter Scitamineas provenisse autumata.*

AUCKLANDIA COSTUS. *Falc.*

Habitat passim in clatis apertis montibus circa Cashmeer ad altitudinem 8000-9000 ped. supra marc. Floret Julio; fructus maturescit Octobri. (Vidi viv. spont. florent. et fructif.)

Descr. *Herba* subgregaria, 6-7 pedes alta, puberula; caulibus annuis; radice perenni. *Radix* irregulariter cylindracea, cartilagineo-succulenta, crassa, ramosa, odorem gratum suballiacum valde pungentem redolens, et saporem fervidum mordicantem aromaticum demùm subamarum ferens; collo crassitie ferè carpi, 2-3-chotomo, totidem vel plures ramos emittente, deorsùm in ramulos plures divergentes, leviter flexuosos et tortos, subfusiformes, spithamam usque ad pedem longos, pollicem ad sesquiunciam crassos, diviso, undique fibras succulentas simplices vel divisas pennam anserinam crassas emittentes; epidermide leviter corrugatâ, in plantâ recenti sordidè et pallidè luteâ, in siccâ fuscâ vel griseo-nigricanti. *Caules* solitarii, vel plures fastigiatim aggregati, quisque simplex, teres, erectus, strictus, glaber, longitudinaliter sulcatus, foliosus, basi medullâ farctus, suprâ fistulosus, demum suberosus evadens; prope radicem circiter pollicem, apice pennam anserinam crassus. *Folia* radicalia longè petiolata, membranacea, alterna, erecta, amplissima, interruptè sublyratimque pinnatifida, lobo terminali maximo, latè cordato, auriculis subhastatim angulatis, 14 uncias longo, 16 uncias lato, margine eroso-dentato dentibus setâ terminatis, suprâ glabro atro-viridi, subtùs glaucescenti, in venis puberulo; lobis lateralibus parvis sinuato-oblongis, 1-1½ pollicem longis, remotiusculis, in petiolum decurrentibus; petioli elongati, compressi, suprâ canaliculati, 24-28 uncias longi: *folia* caulina remota, sursùm decrescentia, mediocritè petiolata, deltoideo-cordata, acuta, quandoque acuminata, auriculis acutis, cæterùm radicalibus conformia. *Æstivatio* foliorum involuta, junioribus densissimè velutino-glanduliferis: venatio radiatim divergens, venis apertè et distanter reticulatis, majoribus intra marginem anastomosantibus. *Capitula* homogama, multi- (circiter 70-) flora, terminalia, sessilia, arcuè 5-8 aggregata, nunc rarè in foliis supremis axillaria solitaria, 1½ unciam circiter longa. *Receptaculum* inexpansum subglobosum, demùm ovato-ventricosum, pollicem crassum: *squamæ* numerosissimæ, multiseriales, imbricatæ, oblongæ, adpressæ, inermes, cum acumine calloso, setaceo, patulo vel recurvo, inferioribus nunc squarrosis, margine ciliato-scabridæ, basi incrassatæ, juniores lanâ intertextâ vestitæ. *Receptaculum* cartilagineum, convexum, alveolatum; *alveolorum* marginibus in fimbrillas setiformes subæquales, persistentes, ovariis triplo longiores productis. *Flores* atro-purpurei. *Corollulæ* omnes hermaphroditæ, æquales, tubulosæ, 5-fidæ, extùs plus minus curvatæ, 8-10 lineas longæ, tubo elongato, gracili, limbo triplo longiore, basi subdilato et in anulum incrassato, fauce longiuscule ampliata, laciniis angustè linearibus reflexis. *Stamina* 5: *filamenta* filiformia glabra; *antheræ* angustè lineares, apice breviter et acutè appendiculatæ, basi in caudas longas, plumoso vel lanato-laceras, attenuatas, productæ. *Pollen* globosum, echinulatum. *Stylus* crassiusculus, filiformis, glaber, basi bulbosus, ultra corollulam et antherarum tubum exsertus, supernè nodoso-tumefactus, ad nodum zonâ pilorum longiorum cinctus; ramis elongatis, linearibus, crassiusculis, omninò liberis, divergentibus, extùs æqualiter puberulis. *Stigmatum* series inconspicuæ et haud pro-

minulæ, ramorum apicem attingentes ibique confluentes. *Pappus* setaceus bi-serialis sordidè luteus, corollulis paulò brevior, setis subæqualibus, plumosis, basi sublamelliformibus, ternatim quaternatimve cohærentibus et in annulum ab ovario solubilem deciduum concretis. Achænium angustè obovatum, internè attenuatum, glabrum, medio crassum, hinc a dorso ad margines paululùm attenuatum, plerumque plus minus arcuatum, apice nectario brevi styliformi, et margine membranaceo parùm prominulo lacero coronatum, basi areolâ terminali instructum, 3-4 lineas longum, $1\frac{1}{2}$ latum. *Integumentum* exterius (pericarpicum) nitidiusculum griseo-spadiceum; intimum (endopleura) diaphanum, tenue, carneum. *Embryo* majusculus, erectus, orthotropus, angustè oblongus, leviter ad margines arcuatus, pallidè viridis; *radiculâ* brevi obtusâ; *cotyledonibus* latis, planis, dorso subconvexis, sensim nec abruptè in radiculam transcurrentibus.

I have named this plant in honour of George Earl Auckland, Governor-General of India, not in compliment to his rank, but as a distinction well merited by his Lordship's services in the cause of Indian botany. The plant was met with during a journey in Cashmeer, undertaken under Lord Auckland's auspices; and its value, as yielding a useful product, makes the application appropriate to the useful direction of his Lordship's views in promoting botanical investigation in our Indian empire.

Aucklandia partakes of the characters of *Saussurea*, *Dolomiaea* and *Carlina*. Its technical difference from the first mainly rests on the characters of the pappus, which, however, in conjunction with the habit, are sufficiently marked to entitle the plant to the rank of a distinct genus.

De Candolle founds his distinction between *Saussurea* and *Aplotaxis* upon the single row of setæ in the pappus of the latter. But this ground is untenable, as a considerable number at least of the Himalayan species have really an outer row of very caducous and filiform setæ, while the inner row is more permanent. These outer setæ frequently disappear in the dried specimen, or are detected with difficulty. Probably De Candolle has drawn his inference from specimens imperfect in this respect. The fact was observed and first brought to my notice by my friend Mr. M. P. Edgeworth. *Lagurostemon*, which De Candolle comprises as a section of *Saussurea*, seems to have better claims to the rank of a distinct genus than *Aplotaxis*.

The medicinal root, celebrated among the ancients under the name of *Cos-*
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tus, has long been a disputed point among botanical writers. Linnæus, upon no good grounds, conjectured it to be produced by the *Costus Arabicus*, which opinion appears to have been first disproved by Jacquin. Sprengel, in his Commentaries on Dioscorides,* states that the Arabian *Costus* was not so designated from growing in Arabia, but because it was imported from India into that country. He does not, however, hazard a conjecture about the plant which produces it. Professor Royle, in his 'Illustrations,'† gives the history of the *Costus* as found in the works of the Persian Hukeems, and correctly infers, that the "*Putchuk*" of the Calcutta bazars is the same as the Arabian *Costus*. He throws out a hint that the root might be the produce of an umbelliferous plant. Ainslie, in his 'Materia Indica,'‡ gives *Putchuck* as the Tamil synonym of *Costus Arabicus*. The necessarily limited nature of a private scientific library at a remote station in India, prevents me from entering further upon the historical part of this subject.

The account of *Costus* given by Dioscorides§ is thus:—"Arabian *Costus* is the best; it is of a white colour, and light, and emits a very grateful and sweet odour. Indian *Costus* holds the second rank; it is thick and light like *Ferula* (καὶ κοῦφοῦ ὡς ῥάροθῆξ). The third sort is the Syrian, which is heavy, in colour like box-wood, and emitting a strong odour. The best *Costus* is that which is fresh, light-coloured, compact, and of firm texture, dry, not worm-eaten, devoid of an acrid smell, and which tastes hot and biting." The medicinal properties are then detailed.

The Persian Hukeems have evidently founded their account of the *Costus* upon that of Dioscorides. The best is to be found in the Tofteli-ool-moomi-nen||, which is thus:—"Köost (كُوسْت) is a root resembling in appearance that of the Mandragora (Löofah لَوْفَه), and comes from the borders of Hindoostan. The plant which yields it is humifuse and stemless, and has broad leaves. There are three sorts: the first, called Arabian or Ocean Köost,

* Kühn's Leipzig edition, 1830, tom. ii. p. 353.

† p. 360.

‡ vol. ii. p. 164.

§ Sprengel's edition, tom. i. p. 29. (lib. i. cap. xv.).

|| MS., article كُوسْت.

(Köost Arabee and Köost buhree قسط عربي و قسط بحري), is sweet, light, white and fragrant. The second, called Indian *Köost*, is of a dirty yellowish colour, light, thick, bitter to the taste, and having but little fragrance. The third is of a dirty red colour, and heavy, and in weight* like box-wood, and fragrant, and without a bitter taste. What follows refers to the first sort, or sweet Köost. The best is what is fresh, white, not worm-eaten, and having a hot biting taste. It retains its virtues good for four years; and the difference between it and Elecampane (?) (Rasun راسن), or Damascus *Köost*, is in this, that Elecampane is harder, and has not the fragrant odour and biting taste of Köost. Köost is hot and dry in the third degree; it is diuretic, revulsive, emmenagogue, hepatic, deobstruent, a universal antidote to animal poisons, attenuates the secretions, a powerful aphrodisiac, vermifuge, lithontriptic, &c. &c." He then goes on to enumerate the diseases in which Köost is efficacious, a list comprising nearly the whole chapter of human ills.

That the root of *Aucklandia* is the *Costus Arabicus* of the ancients, is supported on numerous grounds. 1st. It corresponds with the descriptions of the *Costus* given by the ancient authors. 2nd. The coincidence of names: in Cashmeer the root is called *Köot*; and the Arabic synonym is said to be *Köost*, both given as synonyms by the Persian Hukcems, and names by which the medicine is known in all the bazars of Hindoostan Proper; in Bengal the Cashmeer *Köot* is called *Putchuk*: and it appears by a note in Dr. Royle's 'Illustrations,' that Garcias ab Horto gives "Pucho" as the Malay synonym of

* The reading adopted by Dr. Royle, and what occurs in all the Persian manuscripts to which I have been able to refer, is سنگین و در وزن شیه, بچوب شمشاد, "heavy, and in weight like box-wood:" but it appears to me that this is erroneous, and that رنگ, "colour," ought to be read instead of وزن, "weight:" 1st, because the description would then accord with that of Dioscorides; 2nd, because the Persian Materia Medica authors, in hardly any one other instance, give a similitude in weight, while they constantly quote some corresponding colour; 3rd, because the root is already declared to be heavy: writing "wuzun" for "runk" is an error quite within the probable contingencies of transcription.

Costus Arabicus. 3rd. *Köot* is used at the present day for the same purposes in China, as *Costus* was formerly applied to by the Greeks and Romans. 4th. The direct testimony of the Persian authors, that *Köost* comes from the "borders of India," and that it is not a production of Arabia. 5th. The commercial history of the root gathered in Cashmeer under the name of *Köot*. It is collected in large quantities and exported to the Punjab, whence the larger portion goes down to Bombay, where it is shipped for the Red Sea, the Persian Gulf and China; a portion of it finds its way across the Sutluj and Jumna into Hindoostan Proper, whence it is taken to Calcutta, and bought up there with avidity, under the designation of *Putchuk*, for the China market. These proofs appear to be as conclusive as a question of the kind will admit of.

In M'Culloch's 'Commercial Dictionary*,' it is stated that "Putchok" is the root of a plant which grows abundantly in Sinde. I have no means of referring at present to his original authority; but it is probable that this is a mistake, which has originated in Sinde being one of the countries through which *Köot* passes in its commercial transit; in like manner as it was called *Costus Arabicus* by the ancients, from Arabia being the country from which it was brought to them.

In Ainslie's 'Materia Indica†,' "Kootka" is mentioned, on the authority of Kirkpatrick, as a root produced in Nepal. This, however, is the produce of a very different plant, and has no relation with *Köot*, besides the similarity of names.

Aucklandia grows in immense abundance on the mountains which surround Cashmeer; but, like certain other plants of that valley, its range of distribution in the Himalayas is very limited. It is nowhere found, except in the immediate vicinity of Cashmeer, although *Rhæum Emodi*, *Aconitum heterophyllum*, and *Rhododendron anthopogon*, the plants with which it is associated, have a very extensive range of distribution all along the western half of the Himalayan range. It does not extend northwards beyond the valley of the Krishna Gunga, where I found it near Goress. I nowhere met with it in the valley of the Indus Proper, either in or below Little Thibet. I know not

* 2nd edition, p. 959, Art. "Putchok."

† Vol. i. p. 165.

whether it occurs in the Hindoo-koosh range or no. Mr. Griffith will be able to determine this*.

Aucklandia is a gregarious plant, occupying the open, sloping, moist sides of the mountains, at an elevation of about 8000 to 9000 feet above the sea. In Cashmeer it is chiefly used for the protection of bales of shawls from worms, which its very pungent odour is well calculated to effect. It is not used by the Cashmeerians in medicine†, or, at any rate, it has but little reputation with them in that way. The same is the case in Hindoostan, where, notwithstanding the high virtues attributed to it by the Persian authors, it is hardly ever prescribed in practice. I have frequently been asked, when in Cashmeer, where and for what purpose the immense quantities of the root, annually collected, could find a market. The roots are dug up in the months of September and October, when the plant begins to be torpid; they are chopped up into pieces from two to six inches long, and exported without further preparation. The quantity collected is very large, amounting, so far as I could learn, to 10,000 or 12,000 khurwars (of 96 seers or 192 lbs. or about two million pounds per annum). In 1838, the Governor of Cashmeer had imposed a contract upon Raja Kak, the Peshcar of Kamraj, to supply 5000 khurwars from the western purgunnahs alone; the zumeendars agreeing to land the article at Somfre, a town on the Behut river below the city, for Hurry Singhee Rs. 2.8 the khurwar, including cost of collection, carriage, &c., the

* *Dolomiaea macrocephala*, belonging to a nearly allied genus of the *Carlineæ*, and having also, like the *Aucklandia*, a highly aromatic root, is well known in Cashmeer and Thibet by the name of "Dhoop" and "Googul Dhoop." It is burned as an incense in their temples by the Hindoo Cashmeerians. It occurs associated with *Aucklandia*, but, unlike the latter, it has an extensive range of distribution, stretching from Nepal to Cashmeer.

† These remarks refer to the root. From inquiries made subsequently to my leaving the valley, I am led to believe that the stem of the Kōot plant is called "Wuft-Angil" in Cashmeer: it is suspended from the necks of children to avert the influence of the evil eye, and to expel worms. In the Punjab, to which it is exported in large quantities, the stem of the Kōot is called "Mool-Guttee" (perhaps a vitiation of Mool-Kootee?), and it is used for the same purposes as in Cashmeer. I find that an article is brought from the Punjab to Jugadree in large quantities, and thence exported to Bengal under the name of "Poongee." It is said to be the stem of the Kōot, and the specimens which I have seen agreed with it in every respect. I have not yet been able to follow up the history of "Poongee" in Bengal.

Hurry Singhee rupec being a debased coin, equal in value to 10 anas 8 pie of the Company's rupee, at the average rate of exchange. Taking the Company's rupec at 2s., and assuming Rs. Hurry Singhec 3, which it sometimes reaches, to be the average price of Kōot per khurwar, the cost of collection and transport to a mercantile depôt in Cashmeer would be 2s. 4d. per cwt., a fact which will hardly be credited in England, and strongly indicative of the depressed condition of the valley, and of the great abundance of the article. Kōot, however, is not allowed to reach its fair mercantile value, as the Governor keeps the trade in his own hands by forcing contracts on the zumeedars, who alone collect it. The commodity is laden on bullocks, and exported to the Punjab, whence it finds its way to Bombay, and a portion gets to Calcutta through Hindoostan. Immediately before it enters the Company's territories the value is enhanced at Jugadree on the Jumna to Company's rupees, 6. or 8. per maund, or about 16s. 9d. to 23s. 4d. per cwt. At Calcutta and Bombay it is readily bought up for the China market, where, according to the Canton price-current lists*, it fetches 13 Spanish dollars the pecul: taking the pecul at 133 lbs., and the Spanish dollar at 4s. 4d., the commercial value of Kōot at Canton is 47s. 5d. per cwt., an immense increase upon the prime cost of the article in Cashmeer.

The Chinese burn Kōot, like the ancients, as an incense in the temples of their gods; and they also attach great efficacy to it as an aphrodisiac. Taking into account the vast population, and the uniformity in manners and customs which prevails all over China, it is probable that the consumption of Kōot by the Chinese is at present limited by the supply, and that they would readily take a much greater quantity than under existing circumstances finds its way into the market. The demand for the article in Cashmeer is so lively, that a surplus stock never remains in hand for any length of time; and as the plant is not an annual, but a perennial, which requires several years to mature the root into a commercial quality, it seems probable that the valley could not furnish any considerable increase upon the quantity now collected, without tending to extirpate, or, at any rate, greatly suppress the numerical amount of

* M'Culloch's Dictionary of Commerce, Art. 'Canton,' p. 237.

the plant. The Kōot is entirely a spontaneous production, which costs no trouble besides the collection of it.

From an examination of the circumstances under which *Aucklandia* grows, and the plants with which it is associated, I have no hesitation in stating that *Kōot* could be produced to an unlimited extent, of the best quality, in the Himalaya mountains within the British territories, at elevations of about 8000 feet above the sea. It would form a valuable addition to the native wealth of the Hill people. Some plants introduced from Cashmeer are now undergoing a trial at the experimental Garden at Mussooree.